ABSTRACT OF THE DISCLOSURE

A light-driven energy generation system using proteorhodopsin is provided. Proteorhodopsin sequences were retrieved and amplified from naturally occurring members of the domain Bacteria using proteorhodopsin-specific polymerase chain reaction primers. Proteorhodopsin sequences were placed in expression vectors for production of proteorhodopsin proteins in a host, for instance, *E. coli* and other bacteria. The system also includes a light source and a source of retinal, that allows the system to convert light into biochemical energy. The generated biochemical energy could be mediated into electrical energy by a mediator.

DEPOSITS

Depository address: 10801 University Boulevard, Manassas, VA 20110.

The Escherichia coli containing cloned DNA BAC 31A8 having assigned ATCC number PTA-3083, the Escherichia coli containing cloned DNA BAC 40E8 having assigned ATCC number PTA-3082, the Escherichia coli containing cloned DNA BAC 41B4 having assigned ATCC number PTA-3080, and the Escherichia coli containing cloned DNA BAC 64A5 having assigned ATCC number PTA-3081, all having been deposited on February 21, 2001 with the ATCC Patent Depository.

The Escherichia coli containing a plasmid PAL E6 having assigned ATCC number PTA-3250, the Escherichia coli containing a plasmid HOT 0m1 having assigned ATCC number PTA-3251, the Escherichia coli containing a plasmid HOT 75m4 having assigned ATCC number PTA-3252, and the Escherichia coli containing cloned DNA BAC64A5 having assigned ATCC number PTA 3082, all having been deposited on March 30, 2001 with the ATCC Patent Depository.